

Toxicity Reduction Evaluation Work Plan

Introduction:

The United States Environmental Protection Agency (EPA) issued National Pollution Discharge Elimination System (NPDES) permit number AK - 003865-2 to Cominco Alaska Incorporated which became effective on August 28, 1998. The permit regulates discharge of water associated with the Red Dog Mining operation. Sections I.A.1., I.D.7., and I. H. state the permitted requirements for Whole Effluent Toxicity (WET) Testing of water samples collected from Outfall 001, and ambient monitoring stations 9 and 12. Outfall 001 is required to be sampled monthly and has a WET test maximum daily limit of 12.2 TU_c and an average monthly limit of 9.7 TU_c.

The following sections are the relevant portions of the permit related to this Toxicity Reduction Evaluation (TRE) Work Plan:

- I.H.3.a, b, and c. Specifies the requirement to prepare a TRE work plan and the minimum scope of the work plan.
- I.H.5.a. Specifies that if a WET test permit limit is exceeded, Cominco Alaska Incorporated will conduct a TRE as specified in the TRE work plan.
- I.H.5.b. Specifies reporting requirements for the TRE findings.
- I.H.6. Specifies that if two WET test permit limits are exceeded in a single discharge season, Cominco Alaska Incorporated will conduct a Toxicity Identification Evaluation (TIE).

Objective:

The objective of this TRE work plan is to define the procedure that Cominco Alaska Incorporated will follow in the event that a WET test result exceeds the permit limit. A TRE work plan was submitted to EPA in September 1998. During the 1999 discharge season, a TRE was initiated and subsequently followed by a Phase I TIE. Several areas for improvement of the work plan were identified through the 1999 activities. This TRE work plan is intended to replace the 1998 submittal and incorporate experience gained during the 1999 discharge season.

TRE Implementation:

WET test samples will be collected as early in the month as practical. The preliminary test results will be faxed from the laboratory conducting the analysis to the Red Dog Environmental Department upon completion and preliminary validation of the test. Should the effluent toxicity results exceed a permit limit, the following actions will be immediately initiated; these activities constitute the TRE.

1. The designated EPA compliance officer will be notified.
2. A Red Dog Environmental/Operations meeting will be conducted. At this meeting all departments associated with the Red Dog Mining Operation will be represented by supervisor grade personnel.
3. A split WET test sample will be collected and sent to the laboratory reporting the exceedance and a different WET test certified laboratory.
4. The laboratory reporting the exceedance will be requested to conduct a thorough and expedient investigation into the validity and QA/QC of the analysis.

TRE - First WET Test Limit Exceedance:

The following is a detailed explanation of the TRE that will be initiated upon notification of exceeding an effluent toxicity limit for the first time in a discharge season. If during any of the following investigation the cause of the exceedance is identified, corrective action will be taken immediately, and EPA will be notified.

1. The permit specifies that violations of discharge limitations be reported within 24-hours of the permittee becoming aware of the circumstances. Currently, Mr. Robert Grandinetti is the EPA compliance officer for permit AK - 003865-2. He will be notified of the exceedance via telephone/phone mail at (206) 553-1283 within 24-hours and via fax and/or regular mail within 5-days.
2. A Red Dog Environmental/Operations meeting will be conducted. All departments associated with the Red Dog Mining Operation will be represented by supervisor grade personnel or higher. The purpose of the meeting will be to identify any possible change in any aspect of the operation that could have impacts on the quality of the discharge water (Outfall 001). This would include but would not be limited to changes in water treatment plant reagents, water treatment plant reagent dosing, water treatment plant operation, mill reagents, mill reagent dosing, mill operation, mill tailings discharge, mill tailings discharge location, ore feed type, mine activities, mine water handling, mine site sewage treatment plant, PAC facilities, spills, and/or climatological impacts. All departments would be thoroughly scrutinized for changes that could affect the discharge

water toxicity. Attachment A contains a list of the standard chemicals used at the Red Dog Mining Operation.

3. The discharge water (Outfall 001) will be re-sampled with a split going to the laboratory reporting the exceedance and another split going to a different WET test certified laboratory. The purpose of the re-sample is to determine if the elevation in toxicity was a limited duration spike that has dissipated or is a persisting increase in toxicity. Should the effluent toxicity decrease in the second sampling event, the sample results will be used in calculating a monthly average and perhaps avoid a monthly average toxicity limit exceedance. The split sample will help to differentiate a true effluent toxicity increase from an apparent effluent toxicity increase. Large variations in the laboratory results could indicate that the toxicity exceedance is merely a laboratory anomaly. Exceeding the WET test permit limitations with the second toxicity test does not establish the pattern of toxicity that would constitute initiation of a TIE.
4. The laboratory reporting the initial exceedance will be requested to expedite the completion of the WET test final report. Unlike the preliminary results, the final report contains the raw data and the reference toxicant testing results and has gone through the full laboratory QA/QC procedures and the entire data validation process. The laboratory will also be asked to identify any variations in lab procedures, dilution water, nutrient sources, other reagents, lab personnel, and the general health and vigor of their cultures.
5. A report detailing the findings of the investigation will be provided to EPA upon conclusion of the TRE.

Second WET Test Limit Exceedance:

Split samples including refresh samples will be collected every month after the first WET test exceedance of a given discharge season. One split will be sent to the laboratory for analysis and the other split will be stored on-site in a refrigerator. The stored sample will be retained until the toxicity test results are reported. If a second exceedance occurs, the stored sample as well as freshly collected samples can be used for TIE testing.

Upon notification of a second WET exceedance during a single discharge season, a second TRE will be initiated. Should the TRE identify the cause of the elevated toxicity, a limited TIE will be conducted to verify the TRE findings. Failure of the TRE to identify the cause of the toxicity increase would necessitate a Phase I TIE to identify the toxicant. A Phase I TIE similar to Attachment B would be initiated with assistance from consultants. Depending on the results of Phase I, more TIE phases may be required to identify the cause of the elevated toxicity.